

8. This propeller seems particularly adapted as an auxiliary power in merchant vessels, and would not require, like the screw, to be lifted out of the water when not in use.

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ART. II.—*On the "Lyre Bird." (Menura Superba.)* By J. WOOD BEILBY, Esq., Gipps' Land. Communicated by the Honorary Secretary.

[Read to the Institute 4th February, 1857.]

ABOUT 5th July last, while passing through scrub on the margin of the Aar, or Tangel River flowing into the Glengarry, or Latrobe, Gipps Land, the nest of the Lyre bird was discovered in an opening of a few square feet by the hen bird leaving it in alarm. It was found to contain one egg, which subsequently, after leaving the nest undisturbed, in hopes of the hen returning to it, which she did not, was found to be fresh. Other nests similarly occupied were found during the same month. The nests are about two and a half to three feet in height, built upon the ground. The under structure is composed of layers of sticks, interlaced together to the height of 18 to 22 inches. Above this is the nest proper,—interiorly a very soft layer of dry grass, leaves, moss, and down from the birds, arched over, and completely concealed with a network of twisted vines, grass, and moss; the entrance to which is by an opening large enough to admit the hen bird on one side, rounded at top, from which a veil, or curtain, of the long fibrous moss found growing and hanging in long festoons from leaning trees in scrubs and fern gullies, falls, so as to completely conceal the opening when the female is sitting, or has left her nest. The cock bird cannot assist in the task of incubation, as proved by the fact that the lyre tail could not get in, and if outside would frustrate the design of concealment. The whole nest is so artfully constructed of materials of uniform colour, and bears so close a resemblance, exteriorly, to the heaps of drift, or decaying rubbish, accumulating everywhere in the scrub, that, unless the bird be scared out of it by a passer by, it would scarcely attract the investigation of the most observant. The female is said to lay but one egg, but from having

found shells of more near a nest repaired for use this season, and the birds being observed to roost in families occasionally, I am inclined to think that probably the hen may lay a second egg, and then sit close, and thus remain undiscovered. The eggs are as long as a large duck's egg, but thicker. Colour a dappled black, like smooth unpolished black marble, with greyish veins between the rounded black clouding. The hen appears to desert her nest whenever discovered. The young run on the ground, and hastily conceal themselves at the slightest alarm, very soon after leaving the egg. At pairing season, in May and June, and early in July, the male birds are very assiduous in calling the hens to them, and may be heard chiefly early in the morning, and near sun-down, uttering their harsh guttural cry of *Queeuk, queeuk*, accompanied by a loud clear whistling, reminding one of some of the notes of the English black-bird. They are expert mocking birds, and are often heard imitating the cries of the birds and animals familiar to them,—such as cockatoos of various kinds, pigeons, parrots, crows, magpies, &c. I have heard one imitate the howl of a wild dog, and others the sharpening of a saw, hammering, and other sounds made by carpenters, a few days after they had opportunity of hearing such sounds for the first time. While engaged in mocking, the bird is usually burrowing in loose soil (as our domestic fowls do in ashes), and meanwhile gives vent to such a strange variety of imitations, that I have fancied several birds must be joining in them, until I crept to the spot and became a witness to its sport. Individual birds, or pairs, are often in long possession exclusively of certain spots, and may be identified by their proficiency in the imitation of particular sounds. They are difficult to approach to shoot during the day, except where man is unknown to them, and are scared by the slightest sound. Specimens are most easily obtained by ascertaining (by the droppings beneath) the trees upon which they usually roost,—usually a bushy blackwood or wattle about twenty feet high, and shooting them at dusk or in moonlight. They will then not unfrequently it stupidly awaiting a second shot, if the shooter does not move till he has brought down his second bird. They appear to live chiefly upon worms, grubs, and the white roots of couch grass, and some other plants and grasses growing in the loose rich earth common to the scrubs. Their long claws are well adapted for scraping these up. In places frequented by these birds there are numerous smooth topped rounded hillocks,

three or four feet across, of loose soil, freed from all roots of scrub or grass,—the history and use of which are at present unknown to me. Although a very shy bird naturally, attempts to domesticate it by rearing the young under a common fowl have succeeded sufficiently to induce further efforts, with greater care for the safe custody of the chicks.

A nest of the Lyre-tailed Pheasant will be forwarded to the Museum when an opportunity occurs for its transmission, by land or sea, from this presently inaccessible locality.

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ART. III.—*On the Phenomena attending an Interesting Case of Mirage.* By Professor WILSON, M.A., *Melbourne University.*

[Communicated to the Institute 4th February, 1857.]

ON Sunday, 18th January last, about a quarter before two o'clock, I observed an interesting case of Mirage on the Sydney road. I was standing about twenty yards from the south-east entrance to the Royal Park, looking towards Brunswick. The road here is three chains wide, very dusty, bounded on the left by the trees of the Royal Park, and on the right by those of the Prince's Park; at the farther end, distant about a mile and a quarter, the "Sarah Sands Hotel," is visible and some trees with a well-marked outline. On the day in question the house and trees appeared to rise out of a lake, brilliantly illuminated by the sun, and in parts slightly agitated by the wind, but not so as to interfere with a very distinct inverted image of the house and trees formed by reflexion in the seeming water.

My position was at the foot of a slight rise in the road, the summit of which, at the distance of a few yards, was nearly on a level with the eye. The sandy surface of the ground was much heated by the sun, and at the same time a cool south wind was blowing briskly, so that the air, heated and rarified by contact with the ground, was rapidly cleared off by the cool wind, leaving only a thin film of rarified air along the surface of the ground. The rays of light from the sky, and objects at a distance of more than a mile incident on the surface of this rarer medium at nearly a right angle, suffered reflexion in a manner very analogous to that known as total internal reflexion, and thus produced the inverted